Marketing Analysis of Plantain in Owo and Ose Local Government Areas of Ondo state, Nigeria

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Abstract: This study analyzed plantain marketing in Owo and Ose Local Government Areas of Ondo State, Nigeria. Systematic sampling technique was used in the selection of one hundred and ten plantain marketers in the study area. A well structured interview schedule was the instrument used for data collection. Data collected were analyzed using both descriptive and inferential statistics. The study revealed that most of the marketers (70%) were female with mean age of 43years. Herfindahl index of 0.3 revealed that plantain market tends toward pure competition. Costs and returns analysis showed that plantain marketing is profi Table in the study area with monthly gross margin of N12,214.57 and benefit cost ratio of 1.43. The regression analysis revealed that marketing costs and net returns are negatively related with R2 value of 0.52 and F – value of 21.478 which is significant at 1%. The major marketing problem identified by the highest percentage of respondents is finance. The study therefore recommends that plantain marketers should come together to form plantain marketers cooperative groups from which members could obtain loans at very low interest rates.

Keywords: Marketing analysis, Plantain.

INTRODUCTION

Plantain is one of the most important staple food crops for millions of people both in developed and developing countries, a fact reflected in the gross value of its production. It reaches its greatest importance in parts of East Africa where annual consumption is over 200kg per capita and in West and central African where more than 10 million tons are produced annually and are traded locally (International Institute for Banana and Plantain, 2001).

The economic importance of plantain lies chiefly in its contribution to subsistence economy (Olorunda, 1998). According to him, the continuous availability of harves Table bunches from established areas makes it possible for the crop to contribute to all year round food security for consumers and income among marketers and producers.

In Nigeria, four main types of plantain are available with distribution strictly based on their bunch characteristics. These are; the horn type, French type, false type and false horn type. The false horn type is the most widely distributed because of its ability to tolerate poor soil conditions. The producing states include Ondo, Ogun, Osun, Oyo, Cross-river, Imo and Abia

State (Wikipedia, 2007b; Robinson, 1996; Ndubizu, 1995).

Plantain is found in the diet of many Nigerian families. It is a good source of carbohydrate no matter what form it is consumed. It is also a good source of protein, mineral and vitamins. It can be boiled and consumed directly or taken in convenient forms like *Dodo* (fried ripe pulp), Chips (fried unripe pulp) or processed to produce such as plantain flour, local beer (plantain baby food), as well as *Dodo Ikire* (produced from over-ripped plantain). Plantain also possesses medicinal properties.

It can be used to cure ailments like sore throat and tonsillitis, diarrhoea and vomiting. Soya Musa is used in treating Kwashiokor (John and Marshal, 1999; Frison and Shamrock, 1998). It is used to clear mucous, treat lung conditions and ease bladder infection. In addition, plantain has been found to be a powerful antitoxin used to neutralize poison. Externally it is used to stem bleeding and as tropical anti-inflammation for dressing wounds and snake bites. Fermented plantain can be used as a source of alcoholic drink. Further more, dried plantain can be made into flour, which can be eating with soup (Saturday Punch, 2007). Over the years, plantain peel has been traditionally used to feed goats and sheep. These peels fresh or dry can be processed into feed with little modification.

Due to the nutritional importance of plantain, venturing into its enterprise holds promising potentials. However, the relatively little attention given to plantain is focused on its production technology while only a few is done on its marketing. It is obvious that increased production without corresponding increase in marketing may amount to wastage of resources leaving people on the same platform of malnutrition. The study therefore analyses the complexities of plantain marketing using Owo and Ose local government areas as a case study. Idachaba (2000) claims that it is not sufficient for policy makers to concentrate on solving production problems without reference to their marketing problems because even though actual production may be adequate, marke Table and marketed surplus may be inadequate and unreliable. Plantain is a seasonal crop with relative short shelf life hence, it is available for a limited period and post harvest losses are very high. These situations necessitate a scientific survey of its marketing system. This study aimed at providing answers to the following questions.

i.   What are the socio-economic characteristics of plantain marketers?

ii. What are the marketing activities and functions performed by plantain marketers?

iii. What is the structure of plantain market in the study area?

iv. Is plantain marketing a profi Table business?

v.   What are the problems militating against plantain marketers?

Objectives of the study

The general objective of this study is to analyse the marketing system of plantain in Ose and Owo local government areas of Ondo State. The specific objectives are to;

i.   identify the socio-economic characteristics of the respondents in the study area,

ii. investigate the marketing functions and practices of respondents in the study area,

iii. describe plantain market structure in the study area,

iv. evaluate costs and returns to plantain marketing in the study area,

v. identify the problems facing plantain marketers in the study area.

Hypothesis of the study

The hypothesis of the study stated in the null form is as follows:

Ho: There is no significant relationship between plantain marketing costs and net returns of respondents.

METHODOLOGY

The study is carried out in Ose and Owo local government areas of Ondo State, Nigeria. Ondo state is one of the most popular states in Nigeria with a total human population of 401,147 (National Population Commission, 2006). The state falls under the rainforest vegetation zone with a mean annual rainfall of 1500mm. It has an area of 14606km2 and lies on latitude $7^0 10$'N and longitude 5^0 05'E of the equator. It has 18 local government areas (Wikipedia, 2007a). The study was conducted in Ose and Owo LGAs of the state purposively because these areas are well known for plantain and banana production. They as well produce cocoa, palm oil, cashew and timber.

Two major plantain markets were chosen from the two LGAs i.e Ose and Owo agricultural produce markets. The plantain marketers' stalls found in clusters within the markets were then numbered. Systematic sampling technique was used to select the plantain marketers in every third stall as respondents for this study. A total number of one hundred and ten (110) formed the sample size for this study.

A well structured interview schedule was used to obtain needed information from the respondents and the data were subjected to both descriptive and statistical analysis. Objectives 1, 2 and 5 were analysed by tables using frequency counts, mean values and percentages. Objective 3 was achieved by computing the Herfindahl index for the market and drawing inference from the results. Objective 4 was achieved by calculating the benefit cost ratio, gross margin and net returns of respondents. Multiple regression analysis of the linearised cobb-douglas function was carried out to test the stated hypothesis.

The formulas used in the analyses were as follow:

(1) The herfindahl index (HI)

$$HI = \Sigma S_i^2$$

Where S_i = Market share for respondent i, calculated as: $S_i = \dfrac{q_i}{q}$

Where q_i = bunches of plantain sold per month by respondent i

q = total number of bunches sold per month by all respondents.

(2) The cost and returns analysis

Total cost (TC) = Variable cost (VC) + fixed cost (FC)

Total Revenue (TR) = Price per bunch x number of bunches sold

Benefit cost ratio (BCR) = $\dfrac{\text{Total Revenue}}{\text{Total Cost}}$

Gross Margin = Total Revenue – Variable Cost

Net Return = Gross Margin – Fixed Cost

i.e Total Revenue – Total Cost

(3) The Cobb – Douglas Regression Model

Log Υ $b_0 + b_1 + b_2 \log X_2$ …….. + b12 $\log X_{12}$

Where Υ = Net return (Measured in Naira)

X1 = Price (Naira)

X2 = Labour cost (Naira)

X3 = Rent (Naira)

X4 = Transport cost (Naira)

X5 = Age of respondent (Years)

X6 = House hold Size (Actual number of household members)

X7 = Purchase cost (Naira)

X8 = Years of Plantain marketing experience (Years)

X10 = Source of capital (Dummy)

X11 = Storage Cost (Naira)

X12 = Level of Education (Years of Schooling)

RESULTS AND DISCUSSION

Table 1 revealed the socio-economic characteristics of respondents. Thirty% of the respondents were male while 70% of them were female. This finding corresponds with Akalumbe (1998) that post harvest handling of plantain is still within the domain of women while men are more involved with its production. The Table further showed that most of the respondents (80.9%) fall between 31 and 50 years of age. The mean age was 43 years. The implication of this is that most of the respondents are in their active age when they have the ability of going about their business with vigour. On marital status of respondents, the Table revealed that 62.7% were married while 20.9% were widowed. The remaining respondents claimed to be single, divorced or separated. This shows that only a few of them were not married. Marital status is therefore no barrier to involvement in the business. On the issue of household size, 4.5% have less than three household members, 92.8% claimed between 3 and 8 household members while only 2.7% claimed to have above 8 household members. This revealed that respondents with large, medium and small household size were found in plantain marketing.

Table 1 further revealed that 23.6% of the respondents had no formal education while the remaining were educated to some extent. The analysed data further showed that 73.7% of the marketers claimed to have between 11 and 30 years of plantain marketing experience while the remaining 12.7% and 3.6% claimed ten years or below, and greater than thirty years respectively. The average was found to be 16 years. On the issue of major source of capital the respondents use in financing their plantain business, more than half of them (68.2%) claimed personal saving, followed by 26.4% who claimed to take loans from different cooperative groups to which they belong. Very few submitted that they borrow from friends and relatives while 3.6% took bank loans.

Table 1: Socioeconomic Characteristics of Respondents

Socioeconomic Characteristics	Frequency	Percentage
Sex		
Male	33	30
Female	77	70
Age		
≤ 30	5	4.6
31 – 40	34	30.9
41 – 50	55	50.0
51 – 60	12	10.9
> 60	4	3.6
Marital Status		
Single	2	1.8
Married	69	62.7
Divorced	10	9.1
Separated	6	5.5
Widowed	23	20.9
Household size		
< 3	5	4.5
3 – 5	36	32.4
6 – 8	66	60.4
> 8	3	2.7
Level of Education		
No formal education	26	23.6
Primary	62	56.4
Secondary	10	9.1
Tertiary	11	10.0
Adult Education	1	0.9
Years of marketing experience		
≤ 10	14	12.7
11 – 20	72	65.5
21 – 30	20	18.2
> 30	4	3.6
Major Source of Capital		
Personal savings	75	68.2
Friends and relatives	2	1.8
Cooperative loan	29	26.4
Bank loan	4	3.6
Total	110	100.0

Source: Field Survey, 2007

Table 2 showed that the marketers perform transportation function, and in doing this, 99.5% of them uses vehicles as means of transport while 2.7% and 1.8% respectively opted for motor bikes and headloads. Information collected further showed that the respondents perform storage function. Analysis showed that 29.1% store their ware under sheds, 57.3% store in rented shops while 13.6% claimed to store right in their houses.

On the issue of plantain bulk purchase as part of their marketing function, 40.9% of the respondents buy directly from the producers' farms, 1.8% opted for suburbs while 57.3 claimed that they meet with their suppliers right in the market place. Data analysed showed that the marketers in carrying out their distributing function uses diverse channels. About 10.9% claimed to supply their wares in wholesales. The remaining 26.4%, 42.7% and 20% sell directly to the retailers, final consumers and processors/food vendors respectively. On the issue of labour type used, 54.5% claimed to use family labour, 27.3 claimed to use hired labour while 18.2% submitted that they combine both.

Table 2: Marketing Functions and Practices

Variable	Frequency	Percentage
Transportation means		
Vehicle	105	99.5
Motor bike	3	2.7
Head load	2	1.8
Storage facilities		
Shed	32	29.1
Rented shops	63	57.3
Home	15	13.6
Purchase source		
Farm	45	40.9
Suburb	2	1.8
Market place	63	57.3
Distribution channel		
Wholesalers	12	10.9
Retailers	29	26.4
Consumers	47	42.7
Processors /food vendors	22	20.0
Labour type		
Family	60	54.5
Hired	30	27.3
Both	20	18.2
Sales (bunches sold per month)		
≤ 50	10	9.1
51 – 100	13	11.8
101 – 150	22	20.0
151 – 200	45	40.9
> 200	20	18.2
Total	110	100.0

Source: Field Survey, 2007

In order to determine the market structure of plantain market in the study area, the herfindahl index was computed making use of total sales (bunches of plantain) per month. Herfindahl index is calculated as:

Herfindahl index (HI) $= \Sigma S_i^2$

Where S_i = market share for respondent i, calculated as: $S_i = \dfrac{q_i}{q}$

Where q_i = bunches sold per month by respondent i

q = total no of bunches sold per month by all respondents.

Thus, the herfindahl index (HI) $= \Sigma S_i^2$

$$= 0.3$$

The highest value obtainable here is 1. A very low herfindahl index (0.3) obtained here revealed that the concentration ratio for plantain marketers is very low, thus the market structure of plantain tends toward perfect competition, which is characterized by (1) The product sold is homogenous, (2) There is no barrier to entry in to the business (3) There are many buyers and sellers in the study area.

The Costs and Returns analysis of respondents revealed the following on per monthly average basis:

Variable Cost (VC) = N22,262.11

This include transport cost + storage cost + labour cost + cost of plantain purchase.

Fixed Cost (FC) = N1,874.30

This include transaction land rent + miscellaneous

Total Cost (TC = VC + FC) = N24,136.41

Total Revenue = N34,476.68

Benefit cost ratio (BCR) = Total Revenue

Total Cost = 34476.68

24136.41

= 1.43

The business is very profi Table since the benefit – cost ratio is greater than one. The BCR revealed that for every N1 invested into plantain business by the respondents, N1,43k is obtained.

Gross Margin = Total revenue – variable cost

= N(34,476.68 – 22, 262.11)

= N12,214.57 per month

Net Return = Gross Margin – Fixed Cost

= N(12214.57 – 1,874.30)

= N10,340.27 per month

The costs and returns analysis revealed that on the average each plantain marketer in the study area makes a profit of N10,340.27 per month.

Table 3 showed the major plantain marketing problems identified by respondents. About 27.2% claimed that finance is the major

problems confronting them, 20.9% opted for rapid deterioration in quality nature of plantain, 25.4% for high transportation costs, 9.1% submitted that price fluctuation is a major problem in plantain marketing. The remaining 12.7% and 4.7% identified pilfering and infestation of pests and diseases respectively as major problems.

Table 3: Major Problems Identified

Major Problem	Frequency	percentage
Finance	30	27.2
Rapid deterioration in quality	23	20.9
High transport cost	28	25.4
Seasonality (price fluctuations)	10	9.1
Pilfering	14	12.7
Pests and diseases	5	4.7
Total	110	100.0

Source: Field Survey, 2007

The relationship between marketing costs of plantain and net returns to marketers was determined by regression analysis of the Cobb-Douglas functional form. The model is specified as follows:

$$\text{Log } Y = b_0 + b_1 \log X_1 + b_2 \log X_2 + b_3 \log X_3 + \ldots + b_{12} \log X_{12}$$

Where Y = Net return

X_1 = Price, X_2 = Labour Cost, X_3 = Rent, X_4 = transport cost, X_5 = Age, X_6 = Household size X_7 = purchase cost, X_8 = quantity sold X_9 = Years of plantain marketing experience, X_{10} = Source of capital X_{11} = storage cost, X_{12} = level of education.

b_0 = constant, $b_1 \ldots b_{12}$ coefficient of variables.

The result obtained is as follows:

Variable	Coefficient	t-value
Constant b_0	1.245	0.39
Price (X_1)	0.747	6.719
Labour cost (X_2)	0.027	0.264
Rent (X_3)	-0.181	-1.949
Transport cost (X_4)	-0.185	-1.728
Age (X_5)	0.105	0.796
Household size (X_6)	-0.030	-0.275
Purchase cost (X_7)	-0.214	-2.111
Quantity sold (X_8)	0.237	2.099
Years of experience (X_9)	0.223	2.082
Major Source of capital (X_{10})	0.017	0.715
Storage Cost (X_{11})	0.010	0.075
Level of Education (X_{12})	-0.66	-0.548
$R^2 = 0.520$		
F – value = 21.478 (0.0000) ***		

The equation is thus written as:

$$\text{Log } Y = 1.245 + 0.747 \log X_1{}^{***} + 0.027 \log X_2 + 0.181 \log X_3{}^* - 0.185 \log X_4{}^* + 0.105 \log X_5 - 0.030 \log X_6 - 0.214 \log X_7{}^{**} + 0.237 \log X_8{}^{**} + 0.223 \log X_9{}^{**} + 0.017 \log X_{10} + 0.010 \log X_{11} - 0.66 \log X_{12}$$

N.B: *** significant at 1%, ** significant at 5%, * significant at 10%

Result of the analysis revealed that X_1 (Price), X_8 (quantity sold) and X_9 (Years of plantain marketing experience) are positively related to net returns. Thus, 0.747, 0.237 and 0.223 unit increase returns. Thus, 0.747, 0.237 and 0.223 unit increase each in X_1, X_8 and X_9 will bring about one unit increase respectively in respondents net returns.

On the other hand, variables X_3 (Rent), X_4 (transport cost) and X_7 (purchase cost) were found to be negatively related to net returns. That

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is, 0.181, 0.185 and 0.214 unit increase in each of X_3, X_4 and X_7 will result in corresponding one unit decrease respectively in respondents net returns. The R^2 value of 0.520 means that the estimated variables included in the model explained 52% of variation in net returns of respondents. The F –value of 21.478 is also significant at 1%.

CONCLUSION

From the findings of this study, it could be concluded that plantain marketing is profi Table in the study area. Also, net returns to plantain marketing are affected by estimated plantain marketing costs and selected personal characteristics of marketers. Finally, plantain marketing in the study area could be more profi Table and efficient by finding lasting solutions to various problems faced by the marketers.

Recommendations

Based on the finding that finance is the top-most major problem facing the marketers, this study recommends that the marketers should come together to form plantain marketers cooperative groups, from which members could obtain loans at very low interest rates to finance their business. Such groups can also have a common warehouse with adequate storage facilities and security, where members could store their plantains before they are ready to be sold. This will guard against deterioration in quality as well as pilfering.

Based on the finding that marketing costs and net returns are negatively related, policies and actions that lower the costs of marketing will lead to better market performance and profitability. The three tiers of government can do their own part by renovating existing bad roads and constructing new ones, especially those that link the rural areas with urban areas. This will help in getting the produce to market places in good time and in good shape (quality). It will also bring about a reduction in transportation cost and hence the cost of marketing.

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